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The following evidence is offered with the object of showing by comparison that the space devoted to scientific subjects is utterly insufficient for the enlightenment of the general public.

'Degeneration' (two articles)—less than one and a-half columns.	'Pronunciation of foreign names' (exclusive of Latin and Greek names) over five columns.
'Parthenogenesis' one-half column, ending with 'the whole subject is obscure, however.' The reader is referred to Von Seibold, 'Parthenogenesis' and to Weismann, 'Essays on Heredity.' Both these works are far too technical to be intelligible to the general reader.	'Plattddeutsch' over four columns.
'Amphibia' one-half column.	'Pastoral Poetry' almost three columns.

Under 'Eclecticism' the reader is informed that a certain Dr. Newton founded the theory of cellular pathology and introduced antisepticism in surgery. The scientific world has given the credit of the former discovery to Virchow, and of the latter to Lister. Now I ask, for purposes of information, what did Robert S. Newton (whose biography is not given in Johnson's *Cyclopedia*) write, or publish, upon cellular pathology, prior to the publication of Virchow's work in 1858? To credit anybody except Lister with the introduction of antisepticism is positively absurd.

'Monometallism' and 'bimetallism' are not to be found in this new cyclopædia under the proper headings; indeed, there are not even cross-references to 'money.'

The Johnson *Cyclopædia* is advertised by means of a sixteen-page circular, which bears neither publisher's nor author's name, a large part of it being devoted to abuse of what I have found a valuable, though by no means perfect, reference book, the *genuine* *Encyclopædia Britannica*. The writer of this sixteen page advertisement wishes his readers to believe that one half of the *Britannica* is of no use to Americans, if it is to anybody. I understand that Messrs. Appleton never place their name upon advertising circulars criticising the publications of

other firms. I ask, in all fairness, is this honorable, or even reasonable?

I am not interested in any cyclopædia, nor in any publishing house, and this letter would not have been written had I seen any detailed, impartial criticism of the Johnson *Cyclopædia*.

LAWRENCE IRWELL.

BUFFALO, N. Y.

[Scientific subjects seem to be adequately treated in Johnson's *Cyclopædia*. The circular mentioned by our correspondent is, however, very objectionable, and the Johnson Co. should take steps to prevent its further circulation. J. McK. C.]

SCIENTIFIC LITERATURE.

An Atlas of the Fertilization and Karyokinesis of the Ovum. By EDMUND B. WILSON, PH. D., with the coöperation of Edward Leaming, M. D., F. R. P. S. New York, Published for the Columbia University Press, by Macmillan & Co. 4to with ten plates. Price \$4.00.

This work is of a very high order, and both by its merit and its opportuneness is a noteworthy contribution to science. The basis of the work is Professor Wilson's able investigation of the early history of the ovum of one of our sea-urchins (*Toxopneustes variegatus*, Agassiz). The investigation was long and difficult, and its success is due in the first instance to the patient testing of many reagents until one was found which preserved the living organization of the ovum with a minimum of change. This reagent was a mixture of 80 parts of concentrated aqueous solution of corrosive sublimate and 20 parts glacial acetic acid. As the eggs are very minute, hundreds of them, all in the same stage, were imbedded at once, and sectioned together, leaving chance to determine that some of them be cut in favorable planes. The sections were made as thin as practicable, and were colored by Haidenhain's iron haematoxyline stain, also a reagent recently introduced. Of the many thousands, or perhaps hundreds of thousands of sections, the best have been sought out, and about two hundred of them photographed. From this collection of negatives, forty have been selected and reproduced as phototypes.

The photographs were all made by Dr. Edward Leaming, who in a prefatory note de-

scribes the photographic technique used. The pictures obtained represent the highest perfection of micro-photography yet reached, especially as applied to protoplasmatic structures. The reproductions are very good, but are not equal to the original negatives in delicacy and clearness.

The forty phototypes by themselves suffice to give a complete history of the maturation, fertilization and early segmentation of the ovum. Although they are less clear than many published drawings, these figures unquestionably take their place as the best we yet have, for their partial lack of distinctness is more than atoned for by their absolute accuracy and freedom from that element of personal interpretation which is unavoidable in every drawing, no matter how conscientiously made.

Each phototype is accompanied by a separate explanation of the details shown. This explanation, when necessary, is aided by diagrams inserted in the text.

To the whole is prefixed an abundantly illustrated '*General Introduction*,' in which Professor Wilson gives a summary of our present knowledge of the history of the ovum, so far as it has any bearing on the problems of fertilization. It would be very difficult to surpass this introduction, owing to its felicitous combination of terseness, clearness and completeness.

The work takes its place at once as a classic, and is certainly one of the most notable productions of pure science which have appeared in America. It will be valuable to every biologist, be he botanist or zoölogist, be he investigator or teacher. There will be many to congratulate the author upon his signal success.

CHARLES S. MINOT.

A Monograph of the Order of Oligochaeta. FRANK EVERS BEDDARD. Oxford, Clarendon Press. 1895. New York, Macmillan & Co. 4°, pp. xii+769. 5 plates, 52 wood cuts.

Mr. Beddard's Monograph of the Oligochaeta has been awaited with no little interest by naturalists, and is the third comprehensive work dealing with the earthworms and their allies. The older work of Vejdovsky (1884) was largely morphological in character and confined chiefly to forms studied by the author, while the exten-

sive work of Vaillant (1889-90) deals with the subject more from the systematic side, embracing descriptions of all known forms, but does not include references to literature published later than 1886. The present monograph is an attempt to bring together our knowledge of the entire subject up to the time of publication. It treats of both structure and systematic relationships and incorporates the large list of publications that have appeared during the last decade. No account, however, is given of the embryology of the group, owing, the author tells us in his preface, 'to Prof. Vejdovsky's recently [1889-90] published *Entwicklungsgeschichtliche untersuchungen*, which go into the matter with all details.' The author recommends this work to 'those who are desirous of ascertaining what is known about the embryology of the Oligochaeta.' It is to be regretted that Mr. Beddard did not include the embryology in his general plan and give us a complete treatise on the Oligochaeta. Even an abstract of Vejdovsky's work would have added greatly to the value of the volume for the English reader.

The work is divided into two parts, the first (pp. 1-155) dealing with the anatomy and geographical distribution; the second, or systematic portion, comprising classification, phylogeny and descriptions of genera and species. The anatomical portion treats more of the grosser anatomy, comparatively little space being given to histological matters. We miss more particularly an account of the finer anatomy of the nervous system, the knowledge of which has been enriched by the recent researches of Von Lenhossèk and Retzius. The part devoted to the discussion of the nephridia is, to our mind, the most complete in the morphological portion of the work.

The author divides the Oligochaeta into three groups; (1) Aphaneura, (2) Microdrili, (3) Megadrili. The Aphaneura correspond to Vejdovsky's group of the same name, while the Microdrili and Megadrili are equal in value to the old divisions Limicolæ and Terricolæ of Claparède, with the exception that the Aeolosomatidæ are separated from the Limicolæ and constitute the first group or Aphaneura. The names Microdrili and Megadrili thus have a broader application than Benham's use of them. Among